A High Data Rate Electro-Optic l'base Modulator Driver for a Coherent Optical Communications Application

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ABSTRACT

A compact phase modulator driver circuit capable of high data rates **has** been designed and integrated with a Lithium Niobate electro-optical (EO) crystal for a coherent optical communications system. The modulator driver demonstrated the capability of producing an output signal of **20** Volts peak-to-peak (p-p) amplitude with a 3 dB bandwidth of **210** MHz. The input signal is **2** Volt p-p and the output drives a capacitive load of 3-10 pF, presented by the EO crystal and connecting cable. The driver phase transfer function shows a linear phase shift over the measured frequency range of 10 to 110 MHz, resulting in a constant group delay of 1.92 ns with less than ±2% variation over this range. The rise and fall times for a 20 Volt p-p pulse are less than 1.8 ns with less than 1 3% overshoot at the EO crystal terminals. The dc power consumption for the modulator driver increased from 2.85 W at 100 kHz to 4 W at 100 MHz.

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